WHAT IS CLAIMED IS:

1. A liquid crystal display device comprising:

a first substrate;

a second substrate facing said first substrate;

a liquid crystal layer sealed between said first substrate and said second substrate;

a first electrode formed on said first substrate;

a second electrode formed on said second substrate;

a first molecule orientation film formed on said first substrate so as to cover said first electrode;

a second molecule orientation film formed on said second substrate so as to cover said second electrode;

a first polarizing plate provided outside of said first substrate; and

a second polarizing plate provided outside of said second substrate in a crossed Nicol state to said first polarizing plate,

wherein:

in a non-driving state in which a driving voltage is not applied between said first electrode and said second electrode, liquid crystal molecules are oriented in a vertical direction to said first substrate and said second substrate by said first molecule orientation film and said second molecule orientation film, respectively;

on said first substrate, a structural pattern is formed so as to extend in a first

direction parallel to a surface of said liquid crystal layer and so as to form, in a driving state in which a driving voltage is applied between said first electrode and said second electrode, an electric field periodically changing in a second direction that is parallel to said liquid crystal layer and vertical to said first direction; and

said liquid crystal molecules substantially tilt in said first direction in said driving state.

2. The liquid crystal display device as claimed in claim 1, wherein said structural pattern comprises a plurality of patterns that are formed so as to extend in said first direction on said first electrode and to repeat in said second direction.

3. The liquid crystal display device as claimed in claim 2, wherein each of said plurality of patterns is made up of an insulating material and is a projection pattern.

4. The liquid crystal display device as claimed in claim 2, wherein each of said plurality of patterns is made up of a conducting material and is a projection pattern.

5. The liquid crystal display device as claimed in claim 2, wherein each of said plurality of patterns is a concave pattern formed in said first electrode.

6. The liquid crystal display device as claimed in claim 1, wherein said structural pattern comprises a plurality of patterns that are formed so as to extend in said first direction on said first electrode and repeat in said second direction, and each of said plurality of patterns has directivity directing at least one direction in said first direction.

7. The liquid crystal display device as claimed in claim 6, wherein each of said plurality of patterns is an approximate triangle shape and a vertex of each of said plurality of patterns directs said directivity.

8. The liquid crystal display device as claimed in claim 6, wherein each of said plurality of patterns is a rhombus shape having a first vertex and a second vertex opposing each other in that said first vertex directs said first direction as one direction and said second vertex directs said second

direction as an opposed direction.

9. The liquid crystal display device as claimed in claim 6, wherein each of said plurality of patterns having said directivity has a maximum width within 10 μm.

10. The liquid crystal display device as claimed in claim 6, wherein each of said plurality of patterns having said directivity is formed by a stepwise side.

11. The liquid crystal display device as claimed in claim 1, wherein said first electrode is made up of a plurality of pixel electrodes formed on said first substrate and each of said plurality of pixel electrodes is sectioned into a plurality of domains in that said first direction in one domain is formed so as to cross at a right angle said first direction in other domain which sides are adjacent to sides of said one domain.

12. The liquid crystal display device as claimed in claim 1, wherein on at least one of said first substrate and said second substrate, another

structural pattern different from said structural pattern is formed so as to cross in said first direction and to be repeated in another direction different from said second direction at intervals of a repeating period, which period is substantially greater than another repeating period in said second direction of said structural pattern.

13. The liquid crystal display device as claimed in claim 12, wherein said another structural pattern has a higher height than said structural pattern.

14. The liquid crystal display device as claimed in claim 12, wherein:

said structural pattern comprises a plurality of micro patterns, each of which extends in said first direction and repeats in said second direction at intervals of a first period; and

said another structural pattern comprises a first rough structural pattern that is formed on said first substrate and extends in a third direction crossing said first direction, and a second rough structural pattern that is formed on said second substrate and extends in a fourth direction crossing said second direction,

wherein:

said first rough structural pattern is repeated to form in said fourth direction at intervals of substantially a greater period than said first period; and

said second rough structural pattern is repeated to form in said third direction at intervals of substantially a greater period than said first period.

15. The liquid crystal display device as claimed in claim 14, wherein each of said first rough structural pattern and said second rough structural pattern has a wider width than said micro pattern.

16. The liquid crystal display device as claimed in claim 14, wherein said third direction crosses said first direction at a right angle.

17. The liquid crystal display device as claimed in claim 14, wherein said third direction crosses said first direction at a 45° angle.

18. The liquid crystal display device as claimed in claim 16, wherein:

said structural pattern comprises a plurality of micro patterns, each of which extends in said first direction at a first width and is repeated in said second direction at intervals of said first period;

said another structural pattern comprises:

a first lattice shaped pattern formed on said first substrate so as to extend in said fourth direction vertically crossing said third direction that obliquely crosses said first direction and said second direction; and

a second lattice shaped pattern formed on said second substrate at a position displaced from said first lattice shaped pattern so as to extend in said third direction and said fourth direction,

wherein said first lattice shaped pattern and said second lattice shaped pattern are repeated at intervals of a greater period than said first period.

19. The liquid crystal display device as claimed in claim 18, wherein each of said first lattice shaped pattern and said second lattice shaped pattern has a wider width then said micro patterns.

20. The liquid crystal display device as claimed in claim 18, wherein said third direction crosses said first direction at a 45° angle.

21. The liquid crystal display device as claimed in claim 18, wherein said first lattice shaped pattern sections and forms four domains on said first substrate and said plurality of micro

patterns is formed in each of said four domains so that said first direction in one domain is formed so as to cross at a right angle said first direction in other domain which sides are adjacent to sides of said one domain.

22. The liquid crystal display device as claimed in claim 12, wherein said another structural pattern is a convex pattern.

23. The liquid crystal display device as claimed in claim 12, wherein said another structural pattern is a concave pattern.

24. A liquid crystal display device comprising:

a first substrate;

a second substrate facing said first substrate;

a liquid crystal layer sealed between said first substrate and said second substrate;

a first electrode formed on said first substrate;

a second electrode formed said second substrate;

a first molecule orientation film formed on said first substrate so as to cover said first electrode;

a second molecule orientation film formed on said second substrate so as to cover said second electrode;

a first polarizing plate arranged outside of said first substrate; and

a second polarizing plate arranged outside of said second substrate in a crossed Nicol state to said first polarizing plate,

wherein:

in a non-driving state in which a driving voltage is not applied between said first electrode and said second electrode, liquid crystal molecules are oriented in a vertical direction to said first substrate and said second substrate by said first molecule orientation film and said second molecule orientation film, respectively;

on said first electrode, electrode patterns, which extend in a first direction parallel to a surface of said liquid crystal layer, are periodically repeated to be arranged at intervals of a first width in a second direction, which said second direction is parallel to the surface of said liquid crystal layer and is vertical to said first direction;

said electrode patterns, which are repeated to be arranged in said second direction, are mutually connected each other by connectors;

on said first electrode, a cutout pattern extending in said second direction is formed at substantially a greater second width than said first width; and

said liquid crystal molecules substantially tilt in said first direction in said driving state.

25. The liquid crystal display device as claimed in claim 24, wherein each of said electrode patterns is spaced from another electrode pattern adjacent and corresponding thereto in said first direction, by said cutout pattern.

26. The liquid crystal display device as claimed in claim 24, wherein further on said second substrate, rough patterns extending in said second direction are formed so as to cross said electrode patterns at a view from a vertical direction to said first substrate, and said electrode patterns adjacent to and corresponding to other electrode patterns in said second direction and at least a part of said connector are arranged under said rough patterns at said view from said vertical direction to said first substrate.

27. The liquid crystal display device as claimed in claim 24, wherein at least a part of said electrode patterns further mutually connects along an edge of an opening part of a pixel electrode.

28. The liquid crystal display device as claimed in claim 24, wherein each of said electrode patterns has a tapered shape in said first direction.

29. The liquid crystal display device as claimed in claim 24, wherein each of said electrode patterns has a shape which width becomes narrower toward a top edge in a step-wise shape.

30. The liquid crystal display device as claimed in claim 24, wherein further on said first substrate, third electrode patterns are formed so as to extend along said cutout patterns at a same electric potential as said second electrode under said first electrode.

31. The liquid crystal display device as claimed in claim 30, wherein:

on said first electrode, a first region and a second region are formed so that said first direction in said first region vertically crosses said first direction in said second region; and

said third electrode extends along said first region and the second region on said first substrate.

32. The liquid crystal display device as claimed in claim 26, wherein said rough patterns are made up of convex patterns formed on said second

substrate.

33. The liquid crystal display device as claimed in claim 26, wherein said rough patterns comprises repeated patterns in said first direction, in which said repeated patterns are repeated in said second direction at intervals of a period begin same as or equal to a repeat period in said second direction of said electrode patterns.

34. The liquid crystal display device as claimed in claim 24, wherein said first electrode comprises said first region where said electrode patterns are repeated and said second region which is covered with a uniform conducting film.

35. The liquid crystal display device as claimed in claim 24, wherein:

said connector comprises banded patterns, which width is substantially constant, extending in said second direction; and

said electrode patterns laterally extend from said banded patterns.

36. The liquid crystal display device as

claimed in claim 35, wherein said electrode patterns are repeated to form in said second direction at intervals of a period which is more than 2 μm and less than 15 μm.

37. The liquid crystal display device as claimed in claim 35, wherein a region of said electrode patterns is in a range of 35% through 65% of a region of said banded patterns.

38. The liquid crystal display device as claimed in claim 35, wherein:

each of said banded pattern has a width of approximate 22 μm in said first direction; and

each of said electrode patterns has a width of 3.5 $\pm$ 1 μm at a basement connecting to said banded patterns, a length of approximate 15 $\pm$ 5 μm in said first direction, and forms a cutout pattern of approximate 8 μm.

39. A method for fabricating a liquid crystal display device including a liquid crystal layer clamped between a first substrate and a second substrate, said method comprising the steps of:

(a) forming a pixel electrode pattern on said first substrate;

(b) painting a resist film on said pixel electrode pattern;

(c) exposing and developing said resist film and forming a resist pattern having a shape, in which multiple blanches are repeated, on said pixel electrode pattern;

(d) conducting an ashing process for said resist pattern; and

(e) conducting a thermosetting process for said resist pattern that said assign process conducted;

so that liquid crystal molecules in said liquid crystal layer orient approximately in vertical to a surface of said liquid crystal layer in a non-driving state in which a driving electric field is not applied to said liquid crystal layer, and said liquid crystal molecules orient approximately in parallel to said surface of said liquid crystal layer in a driving state in which the driving electric field is applied to said liquid crystal layer.

40. The method as claimed in claim 39, wherein said step (c) includes the step of exposing said resist film at less than double exposure amount of an exposure threshold for said resist film.

41. The method as claimed in claim 39, wherein said step (b) includes the step of forming said resist film having such a thickness that a thickness of said resist pattern is in a range from 100 μm to 1700 μm after said ashing process.

42. The method as claimed in claim 39, wherein said step (b) includes the step of adjusting a viscosity of said resist film so that a thickness of said resist film is in a range from 600nm to 800nm.

43. The method as claimed in claim 39, wherein said step (e) includes the step of starting the thermosetting process at a temperature lower than 140° C and gradually rising the temperature up to a thermosetting temperature that is lower than 270° C.

44. A liquid crystal display device comprising:

a first substrate;

a second substrate facing said first substrate;

a liquid crystal layer sealed between said first substrate and said second substrate;

a first electrode formed on said first substrate;

a second electrode formed on said second substrate;

a first molecule orientation film formed on said first substrate so as to cover said first electrode;

a second molecule orientation film formed on said second substrate so as to cover said first electrode;

a first polarizing plate provided outside

of said first substrate; and

a second polarizing plate provided outside of said second substrate in a crossed Nicol state to said first polarizing plate,

wherein:

in a non-driving state in which a driving voltage is not applied between said first electrode and said second electrode, liquid crystal molecules are oriented in a vertical direction to a surface of said liquid crystal layer by said first molecule orientation film and said second molecule orientation film, respectively;

on said electrode, a convex pattern, which extends in a first direction being parallel to the surface of said liquid crystal layer, is periodically repeated to be arranged in a second direction, which is parallel to the surface of said liquid crystal layer and crosses said first direction; and

said liquid crystal molecules substantially tilt in said first direction in said driving state.

45. The liquid crystal display device claimed in claim 44, wherein said convex pattern has a tapered shape which width gradually becomes narrower toward a top edge.

46. The liquid crystal display device claimed in claim 44, wherein said convex pattern has a tapered shape which width becomes narrower toward a top edge in a step-wise shape.

47. The liquid crystal display device claimed in claim 44, wherein said convex pattern has a shape which height gradually becomes shorter toward a top edge.

48. The liquid crystal display device claimed in claim 44, wherein:

on said first electrode, another convex pattern extending in said second direction is further formed; and

each of said convex patterns laterally extends from said another convex pattern.

49. The liquid crystal display device claimed in claim 44, wherein said first direction, which is defined for said convex pattern extending to a first lateral direction from said another convex pattern, crosses said first direction, which is defined for said convex pattern extending to a second lateral direction from said another convex pattern.

50. The liquid crystal display device as claimed in claim 49, wherein said first direction crosses said second direction at a 45° angle.

51. The liquid crystal display device as claimed in claim 44, wherein said first direction vertically crosses said second direction.

52. The liquid crystal display device as claimed in claim 51, wherein each of said convex pattern extends in a vertical direction to said another convex pattern.

53. The liquid crystal display device as claimed in claim 52s, wherein said first electrode is sectioned into a first region and a second region so that said second direction, which is defined for said another convex pattern in said first region, vertically crosses said second direction, which is defined for said another convex pattern inn said second region.

54. The liquid crystal display device as claimed in claim 48, wherein said another convex pattern has a wider width than said convex pattern.

55. The liquid crystal display device as claimed in claim 48, wherein said another convex pattern has a higher height than said convex pattern.

56. The liquid crystal display device as claimed in claim 44, wherein said convex pattern is made up of a resist pattern.

57. The liquid crystal display device as claimed in claim 44, wherein said another convex pattern is made up of a resist pattern.

58. The liquid crystal display device as claimed in claim 44, wherein on said second electrode, a convex pattern is formed in parallel to said another pattern.

59. The liquid crystal display device as claimed in claim 44, wherein said convex pattern is replaced with a slit pattern.

60. A liquid crystal display device comprising:

a first substrate;

a second substrate facing said first substrate;

a liquid crystal layer sealed between said first substrate and said second substrate;

a first electrode formed on said first substrate;

a second electrode formed on said second substrate;

a first molecule orientation film formed on said first substrate so as to cover said first electrode;

a second molecule orientation film formed on said second substrate so as to cover said first electrode;

a first polarizing plate provided outside of said first substrate; and

a second polarizing plate provided outside of said second substrate in a crossed Nicol state to said first polarizing plate,

wherein:

in a non-driving state in which a driving voltage is not applied between said first electrode and said second electrode, liquid crystal molecules are oriented in a vertical direction to a surface of said liquid crystal layer by said first molecule orientation film and said second molecule orientation film, respectively; and

a plurality of directional patterns are formed on said first substrate in a common direction.

61. The liquid crystal display device as

claimed in claim 60, wherein each of said directional patterns has a shape that is line symmetry and is not rotation symmetry.

62. The liquid crystal display device as claimed in claim 60, wherein each of said directional patterns is made up of a convex pattern formed on said first electrode.

63. The liquid crystal display device as claimed in claim 60, wherein each of said directional patterns is made up of a cutout pattern formed in said first electrode.

64. The liquid crystal display device as claimed in claim 59, wherein each of said directional patterns is repeated to be oriented in a matrix on said first electrode.

65. The liquid crystal display device as claimed in claim 59, wherein each of said directional patterns includes a set of a plurality of pattern factors.

66. The liquid crystal display device as claimed in claim 59, wherein in said liquid crystal layer, said liquid crystal molecules tilt in a direction directed by each of said directional patterns in said driving state.

67. A liquid crystal display device comprising:

a first substrate;

a second substrate facing said first substrate;

a liquid crystal layer sealed between said first substrate and said second substrate;

a first electrode formed on said first substrate;

a second electrode formed on said second substrate;

a first molecule orientation film formed on said first substrate so as to cover said first electrode;

a second molecule orientation film formed on said second substrate so as to cover said first electrode;

a first polarizing plate provided outside of said first substrate; and

a second polarizing plate provided outside of said second substrate in a crossed Nicol state to said first polarizing plate,

wherein:

in a non-driving state in which a driving voltage is not applied between said first electrode and said second electrode, liquid crystal molecules

are oriented in a vertical direction to a surface of said liquid crystal layer by said first molecule orientation film and said second molecule orientation film, respectively;

a first lattice shaped pattern is formed on said first substrate;

a second lattice shaped pattern is formed on said substrate at a position displace from said first lattice shaped pattern;

a first localized pattern having a slope is formed at a cross point of said first lattice shaped pattern; and

a second localized pattern having a slope is formed at a cross point of said second lattice shaped pattern.

68. The liquid crystal display device as claimed in claim 67, wherein said first localized pattern and said second localized pattern have quadrangular shapes at a view from a vertical direction to the surface of said liquid crystal layer.

69. The liquid crystal display device as claimed in claim 67, wherein said first localized pattern and said second localized pattern have cross shapes, which extend arms obliquely in an extended direction of said lattice shaped pattern at a view from a vertical direction to the surface of said liquid crystal layer.

70. The liquid crystal display device as claimed in claim 67, wherein said first localized pattern and said second localized pattern have cross shapes, which extend arms in an extended direction of said lattice shaped pattern at a view from a vertical direction to the surface of said liquid crystal layer.

71. The liquid crystal display device as claimed in claim 67, wherein said first localized pattern and said second localized pattern have star shapes, which extend arms obliquely in an extended direction of said lattice shaped pattern and extend other arms in the extended direction of said lattice shaped pattern at a view from a vertical direction to the surface of said liquid crystal layer.

72. The liquid crystal display device as claimed in claim 67, wherein each of said star shapes is formed by superimposing a first cross pattern extending arms in an extended direction of said lattice shaped pattern, with a second cross pattern obliquely extending in the extended direction of said lattice shaped pattern.

73. The liquid crystal display device as claimed in claim 1, wherein:

said liquid crystal layer is made up of a nematic liquid crystal and an optical hardened material of the optical hardened composite having a three-dimensional liquid crystal skeleton; and

said liquid crystal molecules and said three-dimensional liquid crystal skeleton of the optical hardened composite orient in different directions in said non-driving state, respectively.

74. The liquid crystal display device as claimed in claim 1, wherein on said first substrate, a thin film transistor is formed so as to correspond to each of pixel electrodes and drives each of said pixel electrodes.